REMARKS/ARGUMENTS

Status of the Claims

Claims 1-8 are pending in this application.

Claims 1-8 are rejected.

The examiner has rejected claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over the art set forth in pages 1-2 of the specification of the instant application in view of Wang et al. U.S. Patent No. 5,429,173.

Wang et al. '173 discloses a method for casting a metal against a solid metal or ceramic insert. The invention contemplates casting a low melting point metal against the surface of a solid, high melting point material so as to bond the cast metal to the solid material via a metallurgical bond. The method includes depositing a latent exoergic coating of two dissimilar elements capable of reacting exothermically to produce an intermetallic phase at the interfacial zone between the solid insert and the cast metal. The dissimilar elements forming the latent exoergic coating are selected from metals and silicon, which react to form intermetallic phases at the temperature of the metal cast there against. The heat from the molten metal triggers the intermetallic-phase-formation reaction that in turn generates substantial quantities of heat at the target surface of the solid material. Once the reaction is initiated, the intermetallics of the latent exoergic coating release a significant amount of heat at the interface between the insert and the cast metal to promote the formation of a prominent metallurgical diffusion bond between the coating, the insert and the cast metal.

Wang et al. '173 teaches that the dissimilar metals are either simultaneously co-deposited as droplets or deposited in very thin layers with about five to 20 layers being required. Further, Wang et al. '173 teaches that it may be desirable to coat the exoergic

layer with a layer of low melting point alloy to enhance the bonding strength at the interface between the exoergic coating and the cast metal. Thus, Wang et al. '173 teaches away from the use of the silicon powder layer that reacts with the aluminum-based alloy cast about the body.

Claim 1 as amended includes the step of spraying the metallic layer with a single layer of silicon powder whereby the silicon powder adheres to the metal layer. Wang et al. '173 applies an exoergic layer formed with multiple layers of silicon that becomes exothermic upon heating and it is the heat generated by the exothermically layer which creates the bond. Wang et al. '173 does not spray a metallic layer with silicon powder such that the silicon powder adheres to the metallic layer. Contrary to the Examiner's assertion, Wang et al. does not teach using any form of silicon as long as the silicon is deposited on to the coated surface. In Wang et al.'173, the silicon forms part of the exoergic coating that generates the exothermic reaction. Further, in Wang et al. '173 the dissimilar elements are simultaneously co-deposited or deposited in very thin layers with multiple layers required. Accordingly, Wang et al. '173 does not teach or suggest the method is set for in claim 1. Applicants submit that claim 1 as written is allowable and hereby request the allowance of claim 1 and the claims depending therefrom.

The examiner has rejected claims 4-8 under 35 U.S.C. 103(a) as being unpatentable over the art set forth in pages 1-2 of the specification of the instant application in view of Sare et al. U.S. Patent No. 4, 953,612.

Sare et al. '612 discloses a method for forming a composite metal article wherein a first component is preheated and positioned in a mold cavity. A melt providing a second metal component is poured into the mold cavity so as to flow into the cavity and over a surface of the first component. A flux is applied to the first component after it is

cleaned and before it is placed in the mold cavity to remove any oxide film. As set forth in Sare et al. '612 the first component is a ferrous material to which the flux is applied. Accordingly, Sare et al. '612 discloses use of a flux containing borates or anhydrous borax when casting a second component over a ferrous first component such as stainless steel.

As set forth in claim 4, one of the steps includes depositing an aluminum-based alloy metallic layer onto a body made from an iron-based alloy. Nowhere does Sare et al. '612 disclosed applying a flux containing borax to a metallic layer formed of an aluminum-based alloy whereby the borax disrupts the native aluminum oxides allowing for metal to metal contact and alloying between the casting and liner. Applicants submit that the examiner has failed to identify any teaching or suggestion in the references leading a person of ordinary skill in the art to combine the references as proposed. It appears that the examiner's basis for the rejection is that Sare et al. '612 discloses a flux containing borax and that it would have been obvious to apply the flux of Sare et al. '612 to the aluminum-based alloy metallic layer that, as set forth in the claim, is applied over a body made from an iron-based alloy. This is nothing more than an "obvious to try" argument which is not the standard under 35 U.S.C. 103. The prior art cited merely teaches pursuing a general approach, that being use of a flux, with the flux cited in Sare et al. '612 being a very specific, high temperature flux. Accordingly, applicant submits that claim 4 as amended is allowable and hereby requests allowance thereof along with the claims depending therefrom.

The Examiner is invited to telephone the applicant's undersigned attorney at (248) 364-0200 if any unresolved matters remain.

Please charge any cost incurred in the filing of this amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

Respectfully submitted,

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